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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/575,737

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Stephen Maldonado

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EXAMINER

MCCRACKEN, DANIEL

ART UNIT

PAPER NUMBER

1793

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DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/575,737	<b>Applicant(s)</b> MALDONADO ET AL.	
	<b>Examiner</b> DANIEL C. MCCracken	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 April 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 and 35-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18, 35-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

Citation to the Specification will be in the following format: (S. # : ¶/L) where # denotes the page number and ¶/L denotes the paragraph number or line number. Citation to patent literature will be in the form (Inventor # : LL) where # is the column number and LL is the line number. Citation to the pre-grant publication literature will be in the following format (Inventor # : ¶) where # denotes the page number and ¶ denotes the paragraph number.

### ***Remarks***

Applicants preliminary amendment dated 4/10/2006 cancelling claims 19-34 and 39-49 has been received. Said claims are acknowledged as cancelled. Claims 1-18 and 35-38 are pending.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 35 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The terms "lower than on conventionally polished glassy carbon" in claim 35 is a relative term which renders the claim indefinite. The terms are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of

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ordinary skill in the art would not be reasonably apprised of the scope of the invention. How does "conventionally polished glassy carbon" behave? Does every glassy carbon behave the same?

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The reference teaches each and every limitation of the rejected claims. The pinpoint citations are in no way to be construed as limitations of the teachings of the reference, but rather illustrative of particular instances where the teachings may be found.

Claims 1-18 and 35-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Huang, et al., *Patterned Growth and Contact Transfer of Well-Aligned Carbon Nanotube Films*, J. Phys. Chem. B. 1999; 103: 4223-4227 (hereinafter "Huang at \_\_\_").

With respect to Claims 1-5, Huang teaches pyrolysis/CVD of iron (II) phthalocyanine over conductive substrates. *See generally* (Huang at 4223, col. 1). This appears to be the same procedure employed by Applicants, and as such, it is expected that the nanotubes/nanofibers are necessarily doped with nitrogen as claimed, owing to the use of a nitrogen-containing precursor. Note that while Huang may devote much of the discussion to quartz substrates, Huang also teaches deposition on conductive substrates, including platinum. (Huang at 4224) ("In this

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regard, we have tried to grow aligned carbon nanotubes on various conducting surfaces including Au, Pt, Cu, and ITO (indium tin oxide).”). As to Claims 6-7, iron (II) phthalocyanine is taught. (Huang at 4223, col. 1). As to Claim 8, argon and hydrogen are taught. *Id.* As to Claim 9, the temperatures are taught. *Id.* As to Claim 10, platinum is taught. (Huang at 4224). As to Claim 11-12, it is expected that both morphologies are necessarily taught, as Applicants themselves state the Huang method produces both. *See* (S. 3: 11-13) (stating that the Huang methods produce CNFs and CNTs). This is the evidence offered to show inherency. “[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency’ under 35 U.S.C. 102, on prima facie obviousness’ under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted].” The burden of proof is similar to that required with respect to product-by-process claims. *In re Fitzgerald*, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)). As to Claim 13, the orientation is taught. *See e.g.* (Huang “Fig. 2”). As to Claim 14, whatever "tuning" is being claimed, it reads on whatever "pyrolysis protocol" is taught in Huang. Stated differently – if Huang “pyrolizes something,” the property is somehow “tuned.” As to Claim 15, an acid treatment is taught. (Huang at 4227, n. 19). As to Claim 16, given the identical process and reagents are employed, it is expected that whatever properties are being claimed are necessarily present. *See* above with respect to inherency and burden shifting.

With respect to Claim 17, to the extent this claim repeat limitations addressed above, the preceding discussion is relied upon. The “producing an electrode” language is not being given

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patentable weight (as a statement of intended use), but even if it were, note that Huang suggests that nanotubes are good for “electrodes.” (Huang at 4223, col. 2).

With respect to Claims 18 and 35-38, and notwithstanding the indefiniteness issues *supra*, the film is taught. *See* (Huang “Figs”) *and* discussion above. As to Claim 35, given the process is taught, it is expected that the properties are taught. As to Claim 36, iron and nitrogen are used in the catalyst, so it expected they are “atomically dispersed.” Claim 37 is interpreted as requiring nothing more than claim 18, as it recites a statement of intended use. If Applicants intend some specific structural configuration, they should claim it.

With respect to Claim 38, note the treatment with an oxygen containing compound. (Huang at 4227, n. 19). Given the nanostructures are the same as in Huang, it is expected that whatever “decomposing” is being claimed, it necessarily occurs. See above with respect to inherency and burden shifting.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a). As to the rejection under 35 U.S.C. §§ 102/103, where the applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the Examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection. See MPEP 2112 III. (discussing 102/103 rejections).

Claims 1-18 and 35-38 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Huang, et al., *Patterned Growth and Contact Transfer of Well-Aligned Carbon Nanotube Films*, J. Phys. Chem. B. 1999; 103: 4223-4227.

The preceding discussion of Huang accompanying the anticipation rejection *supra* is expressly incorporated herein by reference. See above with respect to 102/103 rejections.

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Claims 1-18 and 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang, et al., *Patterned Growth and Contact Transfer of Well-Aligned Carbon Nanotube Films*, J. Phys. Chem. B. 1999; 103: 4223-4227 in view of US 6,077,712 to Livingston.

The preceding discussion of Huang accompanying the anticipation rejection *supra* is expressly incorporated herein by reference. With respect to Claim 10, to the extent Huang *may* not disclose a platinum mesh substrate, note that Huang teaches platinum substrates as useful for their conductive properties. (Huang at 4224, col. 1). Furthermore, Huang identifies making patterned growths. *Id.* Huang also identifies useful applications in electrochemistry. *Id.* Livingston teaches mesh shaped chemical sensors. (Livingston 6: 27 *et seq.*) One would be motivated to utilize a mesh configuration as taught by Livingston in the process of Huang to utilize the electrochemical properties identified in Huang in a gas sensor as taught by Livingston.

### ***Conclusion***

The Examiner makes record of the following as relevant to Applicants disclosure: Maldonado, et al., *Direct Preparation of Carbon Nanofiber Electrodes via Pyrolysis of Iron(II) Phthalocyanine: Electrocatalytic Aspects for Oxygen Reduction*, J. Phys. Chem. B. 2004; 108: 11375-11383. Certainly, more rejections (for example ones utilizing the references provided in the footnotes of Applicants' own journal article) could have been crafted, but they were considered cumulative to those of record. All amendments made in response to this Office Action must be accompanied by a pinpoint citation to the Specification (i.e. page and paragraph or line number) to indicate where Applicants are drawing their support.



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL C. MCCracken whose telephone number is (571)272-6537. The examiner can normally be reached on Monday through Friday, 9 AM - 6 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley S. Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Daniel C. McCracken/  
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Examiner, Art Unit 1793  
DCM

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